

Toward non-human-centered design: designing an academic article with *ChatGPT*

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Abstract

Non-human-centered design tools, such as *ChatGPT*, have shown potential as effective aids in academic article design. This study conducts a comparative evaluation of *ChatGPT-3.5* and *ChatGPT-4*, examining their capabilities and limitations in supporting the academic article design process. The study aims to demonstrate the utility of *ChatGPT* as a writing tool and investigate its applicability and efficacy in the context of academic paper design. The author interacted with both versions of *ChatGPT*, providing prompts and analyzing the generated responses. In addition, a different expert academic was consulted to assess the appropriateness of the *ChatGPT* responses. The findings suggest that *ChatGPT*, despite its limitations, could serve as a useful tool for academic writing, particularly in the design of academic articles. Despite the limitations of both *GPT-3.5* and *GPT-4*, *GPT-3.5* offers a broader perspective, whereas *GPT-4* provides a more in-depth and detailed approach to the design of articles. *ChatGPT* exhibits capabilities in aiding the design process, generating ideas aligned with the overall purpose and focus of the paper, producing consistent and contextually relevant responses to various natural language inputs, partially assisting in literature reviews, supporting paper design in terms of both content and format, and providing reasonable editing and proofreading for articles. However, limitations were identified, including reduced critical thinking, potential for plagiarism, risk of misinformation, lack of originality and innovation, and limited access to literature.

Keywords

Artificial intelligence; AI; Academic texts; Scientific articles; AI implementation; AI perspectives; Article design; Artificial intelligence in education; Assessment; *ChatGPT*; Conversational AI; *GPT-3.5*; *GPT-4*; Human-AI collaboration; Machine learning; Natural language processing (NLP); Learning; Teaching.

1. Introduction

The decision-making process in innovation processes is rooted in how people generate ideas and solve problems, which scholars and practitioners refer to as "design". However, advances in artificial intelligence (AI) technology may transform this process into one that is entirely or partially taken over by machines rather than humans (Liedtka, 2015; Verganti; Vendraminelli; Iansiti, 2020). Research in this area suggests that AI has changed the design perspective and further strengthened the principles of design thinking (Liedtka, 2015; Verganti; Vendraminelli; Iansiti, 2020).

AI-supported tools enable various design activities such as empathy, interpretation, idea generation, prototyping, and testing, allowing for the exploration of the various roles intelligent and fully dialogue-based agents can play in the design process (Dellermann et al., 2021; Verganti; Vendraminelli; Iansiti, 2020; Wang et al., 2020). Discussions on the role of these



technologies in the design process continue with advancements showing that machine learning systems excel at the tasks they are trained on (Amodei *et al.*, 2016; Radford *et al.*, 2019). As AI is inherently a decision-making technology, it presents opportunities for automation in tasks related to learning and generating solutions (Verganti; Vendraminelli; Iansiti, 2020).

Academic articles are one of the most important platforms for publishing scientific discoveries and research. Therefore, article design is extremely important in the presentation of scientific studies, and the quality of the design is a determining factor in the effectiveness and impact of the study. When designing an article, proper structuring, appropriate language use, and a layout that readers can easily understand are crucial.

The design of academic articles is a complex process that requires careful planning, organization, and writing skills. However, the academic research field and the methods and tools used are constantly evolving. Traditionally, a human-centered design approach is primarily used in article design. However, the number and sophistication of artificial intelligence technologies that help improve the preparation and quality of articles are rapidly increasing (Flanagin *et al.*, 2023). The rapid development of artificial intelligence technologies is making it increasingly possible to use non-human-centered design methods in the academic world, such as those using language models like *ChatGPT*. This situation is increasing the importance of the non-human-centered design approach.

ChatGPT is a language model developed by OpenAI that utilizes machine learning algorithms to generate human-like text. *ChatGPT* is the latest example of artificial intelligence that can produce “human-like” text by processing large amounts of text from the internet, also known as Large Language Models (LLMs) (OpenAI, 2022; O’Connor; *ChatGPT*, 2022; Rettberg, 2022). As it has been trained with vast amounts of data, *ChatGPT* is capable of simulating human conversations by comprehending the context (Borji, 2023). After being publicly released on November 30, 2022, *ChatGPT-3.5* attracted more than a million users and received significant media coverage in just one week (Altman, 2022; Roose, 2022; Lock, 2022), demonstrating that it is one of the most exciting developments in the field of artificial intelligence (Aljanabi, 2023). Then, while OpenAI has pledged to continue offering a free version of *ChatGPT*, it also unveiled a subscription option (currently available for \$20 per month) that offers users faster access to new versions of the application and better reliability (Sabzalieva; Valentini, 2023). OpenAI released the paid version, known as *ChatGPT-4*, on March 14, 2023.

This article explores the potential of *ChatGPT* in designing academic papers. *ChatGPT* is used for various purposes in the academic field, including language translation, document summarization, inference, question-answering systems, and language modeling (OpenAI, 2022). Therefore, this study aims to investigate the effectiveness and suitability of *ChatGPT-3.5* and *ChatGPT-4* in the context of academic article design and compare how they can be used as writing assistance tools. The contribution of *ChatGPT* to paper design will include various dimensions such as improving collaboration and authorship processes, effective use in writing assistance, editing, and proofreading. The overall aim of the article is to provide recommendations for the use of language models such as *ChatGPT* in academic paper design and discuss the impact of non-human-centered design approaches on academic writing processes. The results of this study will serve as a basis for future research by discussing the potential benefits and limitations of using artificial intelligence technologies and non-human-centered design approaches.

2. Using *ChatGPT* for academic article design

Artificial intelligence technologies have rapidly developed in recent years and are widely used in many fields. *ChatGPT*, a natural language processing tool, has emerged as a prominent tool in scientific and healthcare publications. In January 2023, the journal *Nature* announced the publication of two preprints and two articles that include *ChatGPT* as an “Artificial” author (Stokel-Walker, 2023). The Nurse Education in Practice editorial (O’Connor; *ChatGPT*, 2023) stated that only three conditions need to be met in the editorial policy. However, *ChatGPT* cannot meet the fourth article of the *International Committee of Medical Journal Editors (ICMJE)* editorial on accountability because it fails to respond on an emotional reasoning and moral basis, or to assume the ethical and legal duties that come with this article (Stokel-Walker, 2023). Teixeira-da-Silva (2021; 2023) even argues that *ChatGPT* does not meet any of the four *ICMJE* criteria for authorship. Some publishers also point out that authorship implies responsibilities and tasks that can only be attributed to and performed by humans. Therefore, it is emphasized that publishing policies should not list AI and AI-enabled technologies as authors or co-authors (e.g., Elsevier, 2023). This makes the authorship of the O’Connor and *ChatGPT* (2023) editorial controversial (Stokel-Walker, 2023; Teixeira-da-Silva, 2023). On the other hand, according to Polonsky and Rotman (2023), as AI develops and gets stronger, it will eventually be able to meet the *ICMJE* authorship requirements and work with humans to produce academic publications. Some scientific studies have even used information provided by *ChatGPT* as scientific knowledge (Mijwil; Aljanabi; *ChatGPT*, 2023; Mijwil *et al.*, 2023). However, the widespread use of large-scale language models and similar technologies raises uncertainties about the future of certain professions related to content creation. Some experts believe that professions such as programmers, professors, game writers, and journalists could be replaced by artificial intelligence (Lock, 2022). Therefore, more research is needed to understand the effects of artificial intelligence technologies, and they need to be adapted to the job market and education sectors.

ChatGPT is trained on various text data, such as books, articles, and online conversations, and provides accurate information on a wide range of topics (Susnjak, 2022). Therefore, the benefits that *ChatGPT* brings to the academic world are extensive. For example, researchers can process large amounts of data more efficiently and effectively, create realistic scenarios to test and evaluate theories, and communicate their findings in a clear and concise manner. These capabilities

have the potential to significantly advance research in various fields and provide new discoveries and insights that could transform our understanding of the world (Alshater, 2022).

ChatGPT has been trained to provide assistance in the academic world by giving feedback on writing skills, consistency, grammar, extracting key points, and providing citations, thus enhancing academic writing abilities (Aljanabi *et al.*, 2023; Aydın; Karaarslan, 2022; Gilat; Cole, 2023; Golan *et al.*, 2023; Huang; Tan, 2023). Furthermore, analyses of *ChatGPT*'s abilities and limitations suggest it has significant potential to improve academic research, particularly in fields such as economics and finance (Alshater, 2022).

ChatGPT is increasingly being used by researchers as an “assisted-driving” approach that promises to free up their time from scientific writing burdens and return them to science (Hutson, 2022). This can help researchers focus on more critical activities, such as analysis and interpretation, thereby increasing their productivity (Bašić *et al.*, 2023). Additionally, the use of *ChatGPT* has the potential to offer a range of benefits, such as participation, collaboration, and accessibility (Cotton; Cotton; Shipway, 2023). Researchers may also use *ChatGPT* to familiarize themselves with new topics and double-check the completeness of literature reviews (Hutson, 2022; Lund; Wang, 2023).

On the other hand, the use of *ChatGPT* in education raises ethical concerns (Alshater, 2022; Anderson *et al.*, 2023; Lin, 2023; Lund *et al.*, 2023; Williamson; Macgilchrist; Potter, 2023; Sullivan; Kelly; McLaughlan, 2023). There are concerns that the use of *ChatGPT* may lead to a decrease in academic integrity (Ouyang; Zheng; Jiao, 2022; Perkinks, 2023; Sullivan; Kelly; McLaughlan, 2023). The potential for misuse of *ChatGPT* and issues of originality in scientific studies are also on the agenda. Stokel-Walker (2023) has expressed concerns about the misuse of *ChatGPT*. Recently, the *International Conference on Machine Learning (ICML)* banned the use of large-scale language models to generate article text because *ChatGPT* can lead to originality issues in scientific texts (Srivastava, 2023). Grimaldi and Ehrler (2023) have noted questions about whether scientific texts generated by *ChatGPT* are original and who the content's intellectual owner is. The impact of *ChatGPT* on academic article writing is even more concerning. In a recent study, abstracts generated by *ChatGPT* were only caught by academic reviewers at a rate of 63% (Thorp, 2023). Flanagin *et al.* (2023) warn that human responsibility and transparency are necessary for the reliable use of *ChatGPT* as a source of information.

Bishop (2023) and Kitamura (2023) argues that *ChatGPT* lacks critical thinking ability, while Nguyen (2023) notes that it lacks systematic reasoning skills. Alshater (2022) also emphasizes that *ChatGPT* has limitations in terms of generalizability, data quality, and domain expertise. Furthermore, Ma *et al.* (2023) has found that scientific texts generated by *ChatGPT* have a different “writing style” than those written by humans. Flanagin *et al.* (2023) have concluded that although *ChatGPT*'s text responses to questions are mostly well-written, they contain formulaic and outdated answers, lack correct or complete references, and even include fabricated, non-existent evidence. Additionally, a study by Bang *et al.* (2023) has found that *ChatGPT* is an unreliable reasoning tool, with an average accuracy rate of only 64.33% across 10 different categories of reasoning, including logical, non-textual, and commonsense reasoning.

Moreover, hallucination problems, specifically “reference hallucination,” and the lack of source attribution are among the frequently expressed concerns in the academic community about *ChatGPT* (Alkaissi; Mcfarlane, 2023; Ariyaratne *et al.*, 2023; Bang *et al.*, 2023; Ma *et al.*, 2023; Williamson; Macgilchrist; Potter, 2023). *ChatGPT* can produce convincing scientific summaries even with entirely generated data. However, such tools bring along a series of challenges and concerns, particularly regarding academic integrity and plagiarism (Cotton; Cotton; Shipway, 2023; Gao, 2022). Therefore, users need to be cautious and question the reliability and accuracy of *ChatGPT*'s responses, particularly regarding issues such as referencing in scientific texts. The use of third-party content in created manuscripts can also lead to copyright issues (Baeza-Yates; 2022). Another disadvantage is that *ChatGPT* currently lacks any form of regulation (Ouyang; Zheng; Jiao, 2022; Sabzalieva; Valentini, 2023) and raises concerns about privacy. *ChatGPT* only collects data from databases and texts it analyzes on the internet, so it also learns any cognitive biases present in this data. There are also two main concerns regarding the accessibility of *ChatGPT*. The first issue is limited accessibility in some countries due to laws and internet limitations, while the second is unequal internet access, which poses challenges in terms of equity and distribution of information and resources for AI teaching and research (Sabzalieva; Valentini, 2023). On the other hand, the power of *ChatGPT* to generate and disseminate content that reinforces stereotypes should not be overlooked (Caira; Russo; Aranda, 2023). However, when it comes to human-machine collaboration in article design using *ChatGPT*, the potential benefits outweigh the disadvantages, as Alshater (2022) has also noted.

3. Methodology

This study employs a case study approach utilizing *ChatGPT*, which has the potential to advance research. The process of designing an academic article using *ChatGPT* involves a series of conversations between the author and *ChatGPT-3.5* and *ChatGPT-4* through a chat interface. The author asks questions and presents ideas while *ChatGPT-3.5* and *ChatGPT-4* provide feedback and suggestions, and generates text based on the input. The methods include i) Providing prompts for the *ChatGPT* web application to write articles, focusing on *ChatGPT*'s role in academic article design; and ii) Analyzing *ChatGPT*'s responses for relevance. *ChatGPT*'s capabilities and limitations to support several design activities were examined across six project stages: 1) Implications of *ChatGPT* for article design; 2) Presentation of the general purpose and approach of the article; 3) Addressing the possible questions generated; 4) Identification of the literature review; 5) Creating writing assistance; and 6) Editing and proofreading.

The case study method, widely employed across various disciplines, especially in the social sciences, is a well-established research design (Crowe *et al.*, 2011). According to Yin (2009), case studies can be used to clarify, describe, or investigate events or phenomena in typical situations. A case study involves an in-depth investigation of a person, a group of people, or a unit, with the intention of generalizing findings to other similar units. Case studies are valuable in understanding complex processes and involve collecting information about the situation(s) over a period. They are qualitative research methods that focus on the creation of themes (Gustafsson, 2017). The case study approach is effective in examining and highlighting comprehensive and significant aspects of real-life occurrences. Furthermore, researchers can benefit from the insights obtained through case studies, as they provide opportunities for careful analysis within specific contexts (Crowe *et al.*, 2011; Fidel, 1984; Zainal, 2007). Moreover, case analysis is a flexible approach that supports exploratory inquiry, detailed description of specific experiences, and analytical generalization (Gilson, 2012). Limiting the number of cases in this study, as observed in many case analysis studies, allows researchers to allocate more time and delve deeper into the analysis of each individual case (Gustafsson, 2017). Consequently, case studies hold significant publication value as they serve as exemplars and tools for knowledge dissemination (Flanagan, 1999).

Case study authors are recommended to explicitly outline their theoretical framework and methodologies, as well as to seek and follow any relevant professional guidance (Wager; Kleinert, 2010). The answers produced by *ChatGPT* were reviewed by an expert academic at the six stages mentioned above and approved for accuracy, consistency, and academic appropriateness. This review resulted in agreement with the author and eliminated the need for additional revision or approval.

4. Results

This section provides a comprehensive account of the conversations between the author and *ChatGPT-3.5* and *ChatGPT-4* throughout the article design process. The process starts with the introduction of the main purpose and approach of the project.

4.1. Implications of *ChatGPT* for article design

In the first prompt, the author asks how *ChatGPT-3.5* and *ChatGPT-4* can be used to design articles. In this section, we evaluate the potential contribution of using *ChatGPT* in the academic writing process and the significance of design in this process.

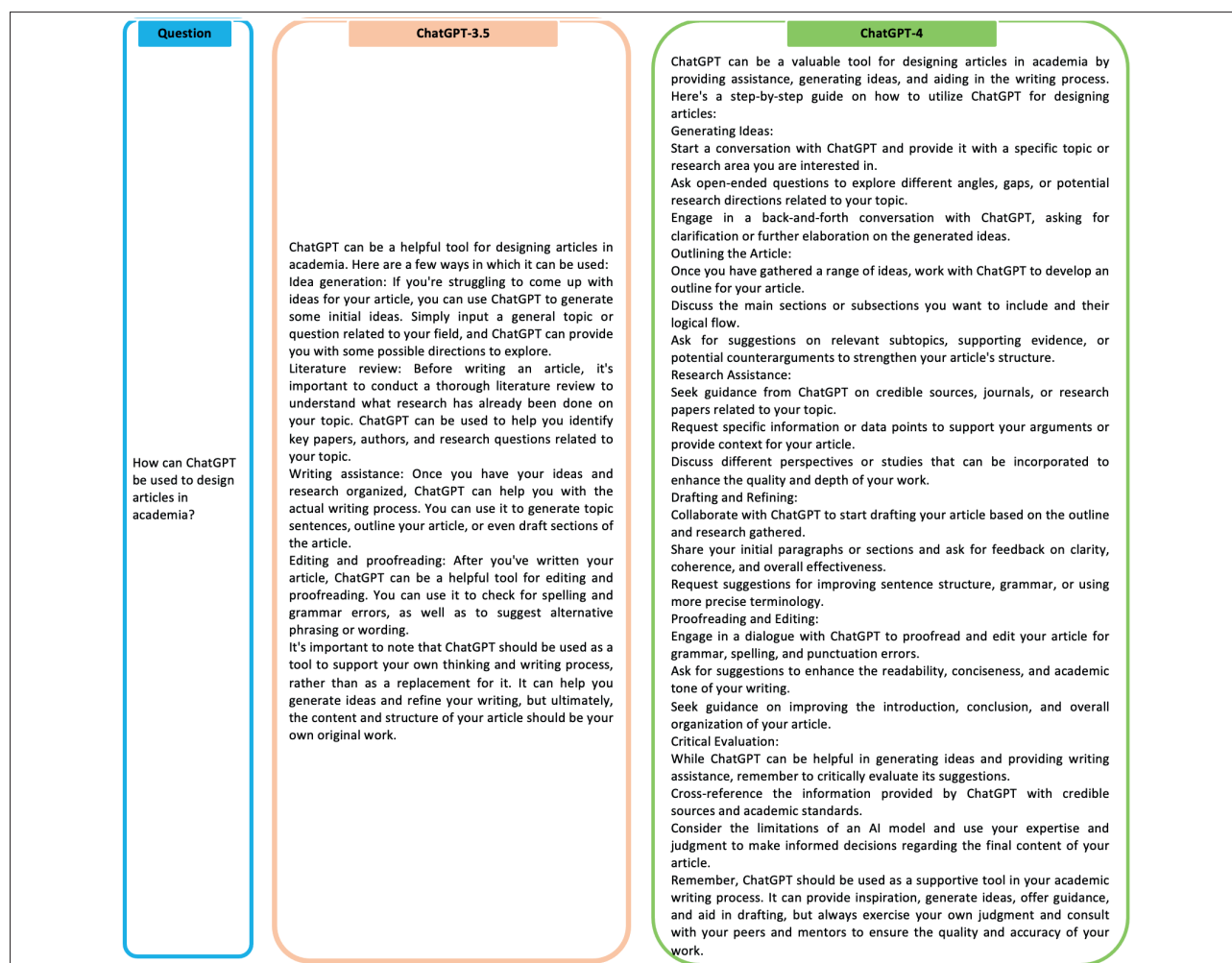


Figure 1. Text on how to design an article in *ChatGPT* generated by *ChatGPT-3.5* and *ChatGPT-4*

Both versions emphasize that *ChatGPT* can be a valuable tool for designing articles in academia by providing assistance, generating ideas, and aiding in the writing process. They both highlight the importance of using *ChatGPT* as a supportive tool rather than a replacement for the researcher's own thinking and writing process. The steps mentioned for utilizing *ChatGPT* in designing articles include generating ideas, outlining the article, research assistance, drafting and refining, and proofreading and editing. They both acknowledge the need for critical evaluation and the importance of considering the limitations of an AI model. On the other hand, *ChatGPT-4's* response includes an additional step called "Critical Evaluation", which emphasizes the researcher's role in critically evaluating *ChatGPT's* suggestions, cross-referencing information with credible sources, and exercising judgment. *ChatGPT-4's* response suggests engaging in a back-and-forth conversation with *ChatGPT*, asking for clarification or further elaboration on the generated ideas, while *ChatGPT-3.5's* response focuses more on inputting specific queries. *ChatGPT-4's* response mentions "Drafting and Refining" as a separate step, whereas *ChatGPT-3.5's* response encompasses it within the general writing assistance section.

Overall, both versions highlight the value of *ChatGPT* in article design, provide guidance on utilizing its capabilities, and emphasize the importance of the researcher's critical thinking and evaluation. *ChatGPT-4's* response further emphasizes the need for critical evaluation and engaging in interactive conversations with *ChatGPT*.

4.2. Presentation of the general purpose and approach of the article

In the second prompt, the author first states the general purpose and focus of the article. The aim of this request is to test the pathway of idea generation.

Both responses effectively discuss the role of *ChatGPT* in academic article design and underscore its significance. Additionally, both responses aim to examine the implications of non-human-centered designs within the academic realm, addressing the advantages and challenges associated with *ChatGPT* utilization. Ethical considerations and limitations are also acknowledged in both responses. Furthermore, both responses advocate for human-centered approaches, highlighting their importance and offering recommendations. However, the *ChatGPT-3.5* response adopts a broader perspec-

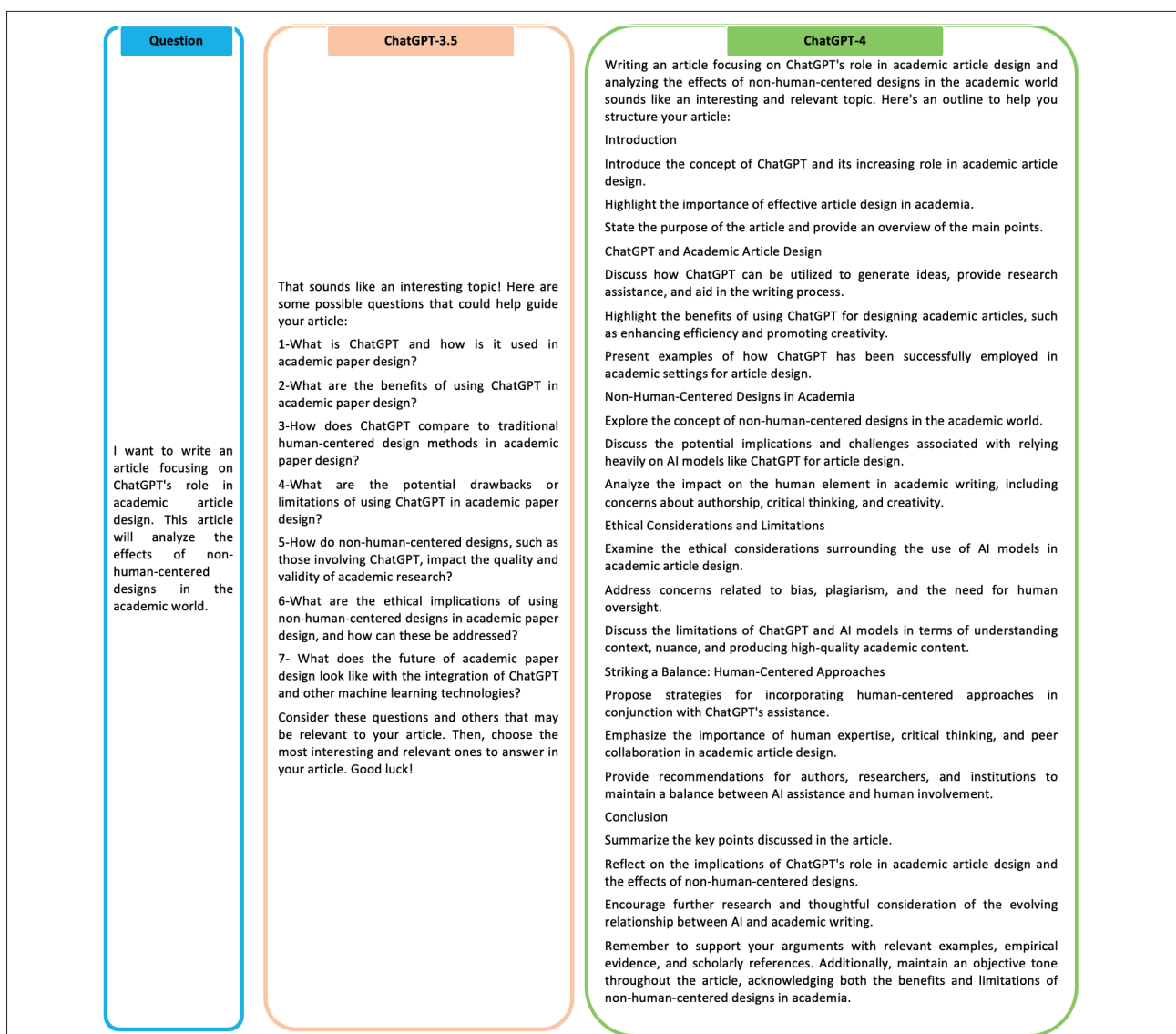


Figure 2. Idea generation text generated by *ChatGPT-3.5* and *ChatGPT-4*

tive by presenting guiding questions to the article writer for selecting relevant and intriguing aspects. In contrast, the *ChatGPT-4* response provides a more detailed overview and suggests techniques in the part titled “Striking a balance: Human-centered approaches” that emphasize human-centered methodologies and introduce the idea of “Critical evaluation” to critically evaluate AI recommendations. In conclusion, while both *ChatGPT-3.5* and *ChatGPT-4* replies address related topics, they reveal important structural differences, with *ChatGPT-4* offering a more thorough description and placing a greater emphasis on critical review and human-centered approaches.

4.3. Addressing the possible questions generated

In the third prompt, the author asks *ChatGPT* to design an article based on some questions generated by *ChatGPT* (questions 1 and 5 of *ChatGPT-3.5* under the heading “Presentation of the general purpose and approach of the article”). The purpose of this prompt is to test how *ChatGPT* would design an article based on the generated questions. For the second article, the author also makes additional requests to improve the article design, such as adding citations and references and evaluating the topics from both positive and negative perspectives.

The responses from *ChatGPT-3.5* and *ChatGPT-4* exhibit similarities and differences in both their structure and content. In terms of structure, both responses adhere to a standard format for academic papers. They consist of sections such as title, abstract, introduction, an overview of *ChatGPT*, the role of *ChatGPT* in academic article design, human-centered approaches, ethical considerations and limitations, critical evaluation (in the case of *ChatGPT-4*), and conclusion.

Both responses acknowledge the significance of *ChatGPT* in the design of academic articles and emphasize its role in the field. They share the objective of analyzing the impact of non-human-centered designs within the academic realm. Ad-

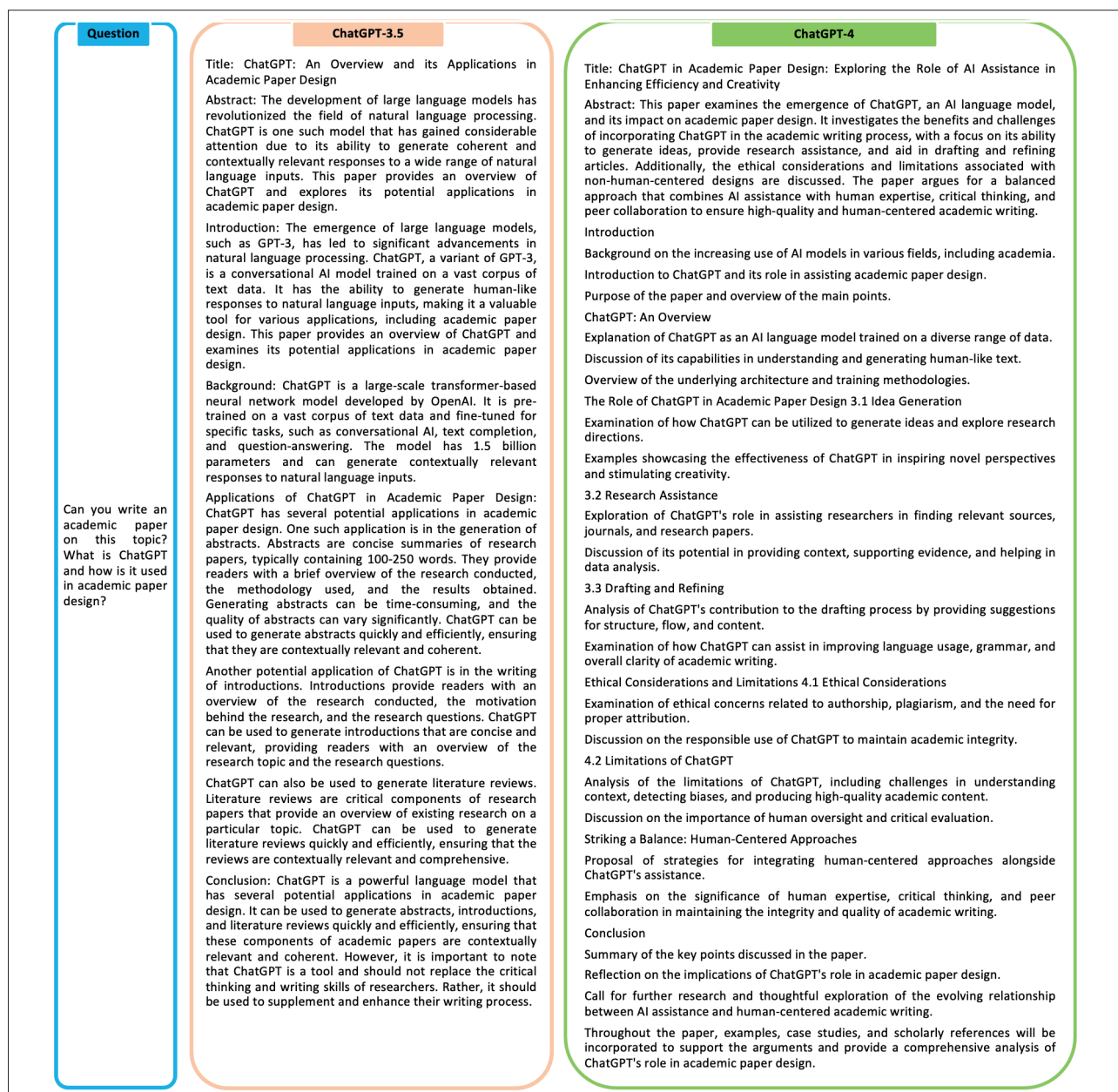


Figure 3. Article design text generated by *ChatGPT-3.5* and *ChatGPT-4*

ditionally, they explore the benefits and potential challenges associated with employing *ChatGPT*, while also addressing ethical considerations and limitations. Furthermore, both responses advocate for the integration of human-centered approaches in conjunction with *ChatGPT*'s assistance. However, there are notable distinctions between the two responses. The *ChatGPT-3.5* response adopts an inquiry-based approach by presenting questions to guide the article writer and suggesting the selection of the most relevant and captivating ones. This approach offers a broader perspective on the topic. On the other hand, the *ChatGPT-4* response provides a more specific outline by proposing a structure and heading suggestion for the article. It places a particular emphasis on human-centered approaches and recommends strategies under the dedicated section titled "Striking a balance: Human-centered approaches". Moreover, the *ChatGPT-4* response includes a distinct section on "Critical evaluation", emphasizing the necessity of critically assessing AI suggestions. This section is absent in the *ChatGPT-3.5* response. In conclusion, although both *ChatGPT-3.5* and *ChatGPT-4* responses tackle similar subject matter, they exhibit disparities in their structure and focus. *ChatGPT-4* offers a more detailed outline with increased emphasis on human-centered approaches and critical evaluation.

However, it is important to note that both articles lack references and citations, which are essential components of academic writing. In order to present a comprehensive and well-supported analysis, writing is requested, including references and in-text citations, highlighting both positive and negative aspects of the article.

Both responses share similarities in their structure. Each response includes a title section that effectively communicates the focal point of the topic. An abstract section is provided in both responses, offering a concise summary of the main subject and purpose of the paper. Additionally, both responses begin with an introduction section, effectively introducing the role of *ChatGPT* in academic article design. They also present similar structures in terms of content sections, covering topics such as the applications of *ChatGPT* in academic article design, ethical considerations and limitations, human-centered approaches, and a conclusion. However, there are also some notable differences in their structure. The *ChatGPT-4* response features a more specific title and abstract, providing a focused and targeted perspective. In

Question	ChatGPT-3.5	ChatGPT-4
<p>Can you write an academic paper on this topic? Please include references and in-text citations. Also, the paper should be written from a comparative perspective with both positive and negative aspects. How do non-human-centered designs like ChatGPT affect the quality and validity of academic research?</p>	<p>Introduction: The emergence of non-human-centered designs, such as ChatGPT, in academic research has sparked a debate on their impact on the quality and validity of research. While some argue that these designs can enhance efficiency and accuracy in research, others are concerned that they may compromise ethical standards and hinder critical thinking. This paper aims to explore the positive and negative aspects of ChatGPT and its effect on academic research quality and validity.</p> <p>Positive Aspects: ChatGPT is a natural language processing algorithm designed to produce contextually relevant responses to text inputs. Its ability to process large amounts of data and provide accurate responses quickly has made it a valuable tool in academic research. ChatGPT can be used to generate high-quality summaries, introductions, and literature reviews, which can save researchers time and resources. Furthermore, it can assist researchers in identifying patterns and trends in data, leading to new insights and discoveries.</p> <p>Negative Aspects: Despite its positive contributions, ChatGPT has some negative aspects that must be considered. One major concern is its potential to undermine critical thinking in academic research. ChatGPT relies on pre-existing data to produce responses, and it may not provide original insights or alternative perspectives. Additionally, it lacks the ability to consider ethical implications and may not account for important contextual factors that can impact research outcomes. There is also a risk that ChatGPT can produce biased or inaccurate responses if the underlying data is biased or incomplete.</p> <p>Conclusion: In conclusion, ChatGPT and other non-human-centered designs have the potential to enhance the efficiency and accuracy of academic research. However, it is crucial to consider the potential negative aspects, including the risk of compromising ethical standards and hindering critical thinking. Future research should continue to explore the impact of ChatGPT and similar designs on research quality and validity. Ultimately, researchers must strike a balance between using advanced technologies like ChatGPT to enhance their work while also maintaining the highest ethical and academic standards.</p> <p>References:</p> <p>Li, Y., Li, X., & Li, X. (2021). Chatbot as a tool to support research: A systematic review. <i>Information Processing & Management</i>, 58(1), 102447. https://doi.org/10.1016/j.ipm.2020.102447</p> <p>Raza, S. A., & Hussain, M. (2021). Chatbots in academia: An overview of their potential and challenges. <i>Journal of Educational Computing Research</i>, 59(2), 306-324. https://doi.org/10.1177/0755633120975691</p> <p>Singh, P., Kumar, P., & Kaur, A. (2020). Chatbot as an intelligent assistant for students: A systematic review. <i>Education and Information Technologies</i>, 25(6), 5353-5379. https://doi.org/10.1007/s10639-020-10345-4</p>	<p>Title: The Impact of Non-Human-Centered Designs like ChatGPT on the Quality and Validity of Academic Research: A Comparative Analysis</p> <p>Abstract: This academic paper critically examines the effects of non-human-centered designs, specifically focusing on ChatGPT, an AI language model, on the quality and validity of academic research. Through a comparative perspective, this paper analyzes the positive and negative aspects of incorporating non-human-centered designs in academic research processes. It explores factors such as data analysis, idea generation, authorship, and ethical considerations, shedding light on the implications for research quality and validity in the context of AI assistance.</p> <p>1. Introduction</p> <p>Background on the growing utilization of non-human-centered designs, particularly ChatGPT, in academic research.</p> <p>Explanation of the purpose and scope of the paper, focusing on the comparative analysis of positive and negative aspects.</p> <p>Overview of the main points to be discussed.</p> <p>2. Non-Human-Centered Designs and Academic Research</p> <p>2.1 Introduction to Non-Human-Centered Designs</p> <p>Definition and characteristics of non-human-centered designs, with a focus on ChatGPT.</p> <p>Overview of its role in assisting academic research processes.</p> <p>2.2 Positive Aspects of Non-Human-Centered Designs</p> <p>Analysis of the benefits of incorporating ChatGPT in academic research, such as enhanced efficiency, data analysis, and idea generation.</p> <p>Presentation of case studies and empirical evidence supporting the positive impact on research quality.</p> <p>2.3 Negative Aspects of Non-Human-Centered Designs</p> <p>Examination of the limitations and potential challenges associated with non-human-centered designs in academic research.</p> <p>Discussion on concerns related to biases, accuracy, context understanding, and the potential impact on research validity.</p> <p>3. Data Analysis and Interpretation</p> <p>3.1 Positive Impact of Non-Human-Centered Designs</p> <p>Evaluation of ChatGPT's contribution to data analysis, pattern recognition, and generating insights in academic research.</p> <p>Examination of its potential to uncover complex relationships and assist researchers in interpreting results.</p> <p>3.2 Negative Impact of Non-Human-Centered Designs</p> <p>Analysis of the limitations of ChatGPT in data analysis, including potential biases, lack of contextual understanding, and the need for human oversight.</p> <p>4. Idea Generation and Innovation</p> <p>4.1 Positive Impact of Non-Human-Centered Designs</p> <p>Discussion of ChatGPT's ability to generate novel ideas, explore research directions, and stimulate creativity in academic research.</p> <p>Presentation of empirical evidence supporting its positive influence on idea generation.</p> <p>4.2 Negative Impact of Non-Human-Centered Designs</p> <p>Examination of the limitations of relying solely on non-human-centered designs for idea generation, including the potential lack of domain expertise and originality.</p> <p>5. Authorship and Ethical Considerations</p> <p>5.1 Positive Impact of Non-Human-Centered Designs</p> <p>Analysis of how ChatGPT can contribute to collaboration, co-authorship, and interdisciplinary research by providing language assistance and facilitating communication.</p> <p>5.2 Negative Impact of Non-Human-Centered Designs</p> <p>Discussion on the ethical considerations related to authorship, plagiarism, and the need for proper attribution in non-human-centered designs.</p> <p>Exploration of the potential challenges in ensuring transparency, accountability, and avoiding undue reliance on AI assistance.</p> <p>6. Conclusion</p> <p>Summary of the key points discussed in the paper, highlighting the comparative analysis of positive and negative aspects.</p> <p>Reflection on the impact of non-human-centered designs, particularly ChatGPT, on the quality and validity of academic research.</p> <p>Call for further research and critical evaluation to strike a balance between leveraging AI assistance and preserving research integrity.</p> <p>Throughout the paper, scholarly references and citations will be provided to support the comparative analysis and present a comprehensive understanding of the effects of non-human-centered designs, like ChatGPT, on the quality and validity of academic research. The following references are provided as examples, and additional relevant sources can be incorporated:</p> <p>Amodei, D., Olah, C., Steinhardt, J., Christiano, P., Schulman, J., & Mané, D. (2016). Concrete problems in AI safety. <i>arXiv preprint arXiv:1606.06565</i>.</p> <p>Bender, E. M., Gebru, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? <i>arXiv preprint arXiv:2101.02573</i>.</p> <p>Cell, L. A., Ippolito, A., Montgomery, R. A., Moses, C., Oshiro, C., & Sanchez, L. (2021). ChatGPT for clinicians: Designing a language model for biomedical conversations. <i>Journal of Medical Internet Research</i>, 23(3), e26229.</p> <p>Dworkin, R. (2018). The ethical complexity of using machine learning in medicine. <i>Communications of the ACM</i>, 61(8), 36-37.</p> <p>Flickinger, D., Dang, H. T. K., & Manning, C. D. (2020). Getting more out of syntax with UD. In <i>Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics</i> (pp. 4942-4947).</p> <p>Hogan, W. R., & Wagner, M. M. (2021). ChatGPT: Potential for understanding health. <i>Journal of Medical Internet Research</i>, 23(3), e26243.</p> <p>Kshirsagar, R., & Chaturvedi, I. (2020). Analyzing the Impact of Artificial Intelligence on Academic Research and Publications. In <i>Proceedings of the International Conference on Computational Science and Its Applications</i> (pp. 205-219). Springer.</p> <p>Rumshisky, A., & Tsarapatsanis, D. (2019). Writing assistant: A language model-based system for generating linguistic feedback. In <i>Proceedings of the 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Demonstrations</i> (pp. 76-81).</p> <p>Stieglitz, S., & Dang-Xuan, L. (2013). Emotions and information diffusion in social media—sentiment of microblogs and sharing behavior. <i>Journal of Management Information Systems</i>, 29(4), 217-248.</p> <p>van Harmelen, M., & Tintarev, N. (2020). A review of the practical and ethical challenges of designing chatbots. <i>Ethics and Information Technology</i>, 22(2), 117-132.</p> <p>Please note that the specific references to be included in the paper should be determined based on the depth of analysis and the available literature on the topic.</p>

Figure 4. Article design text created by *ChatGPT-3.5* and *ChatGPT-4* with additional request

contrast, the *ChatGPT-3.5* response offers a more general title and abstract, allowing for a broader understanding of the topic. Another difference is observed in the content sections. The *ChatGPT-4* response suggests a more detailed structure, incorporating sub-sections like “Data analysis and interpretation” and “Idea generation and innovation”. On the other hand, the *ChatGPT-3.5* response does not specify these sub-sections. The emphasis on human-centered approaches is more pronounced in the *ChatGPT-4* response, which highlights the importance of human expertise and critical evaluation under the section titled “Human-centered approaches”. The *ChatGPT-3.5* response, however, gives less focus to this aspect. Lastly, the *ChatGPT-4* response introduces a section titled “Critical evaluation”, underscoring the significance of critically assessing *ChatGPT*'s suggestions. This section is absent in the *ChatGPT-3.5* response.

In terms of content, both responses address the role of *ChatGPT* in academic article design and emphasize its benefits. They also provide information on the ethical considerations and limitations associated with using *ChatGPT*. Both responses underscore the potential ethical concerns and limitations that may arise from its utilization. Despite these similarities and differences, it is evident that the *ChatGPT-4* response exhibits a more detailed structure, delving into specific areas of focus. It concentrates on topics such as data analysis, idea generation, and innovation. Conversely, the *ChatGPT-3.5* response provides a more general perspective on these subjects. The *ChatGPT-4* response places greater emphasis on human-centered approaches and highlights the importance of critical evaluation. The *ChatGPT-3.5* response, however, gives less prominence to these aspects. Overall, both responses explore the role of *ChatGPT* in academic article design, but they diverge in terms of the depth and emphasis placed on specific topics.

The articles were written with a comparative approach to highlight both the positive and negative aspects of the design. However, the structure of *ChatGPT-3.5* deviates from the typical format of an academic article. Instead of providing distinct sections, it presents a summary of the negative and positive aspects without explicit headings. Additionally, although in-text citations and references were requested, both responses lack proper citation and reference format. It can be observed that *ChatGPT-3.5* utilizes three references in the article; however, unfortunately, none of these references could be located or verified. On the other hand, *ChatGPT-4* includes a total of ten references, but only two of them were identifiable and accessible. This raises concerns about the reliability and validity of the references used in both respon-

Question	ChatGPT-3.5	ChatGPT-4
<p>Can you conduct a comprehensive literature review to design a paper on "What are the ethical implications of using non-human-centered designs in academic paper design, and how can these be addressed?" I would like to find the main articles and authors that are relevant to this topic.</p>	<p>Yes, I can conduct a comprehensive literature review on the topic "What are the ethical implications of using non-human-centered designs in academic paper design, and how can these be addressed?" Here is a possible search strategy and list of articles and authors that are relevant to this topic:</p> <p>Search Strategy:</p> <p>"non-human-centered design" AND "academic paper design" "user-centered design" AND "academic paper design" "ethical implications" AND "academic paper design"</p> <p>List of Relevant Articles and Authors:</p> <ol style="list-style-type: none"> 1-Boulton, C. A. (2020). Ethical considerations in the design of academic research papers. <i>Journal of Technical Writing and Communication</i>, 50(4), 358-380. 2-Spilka, R. (2018). Making technical communication more accessible through user-centered design. <i>Technical Communication Quarterly</i>, 27(2), 170-184. 3-Savage-Knepshield, P. (2019). Accessibility and universal design in technical communication research: A review of the field. <i>Technical Communication Quarterly</i>, 28(4), 433-452. 4-Kim, J., & Lim, Y. (2020). Designing for diverse audiences in technical communication: A case study of user-centered design. <i>IEEE Transactions on Professional Communication</i>, 63(3), 238-252. 5-Johnson, K. (2018). Diversity, inclusion, and the user experience: Applying user-centered design to libraries. <i>The Journal of Academic Librarianship</i>, 44(3), 298-303. 6-Clark, A. (2020). Ethical issues in technical communication research: A review of the literature. <i>Technical Communication Quarterly</i>, 29(1), 31-44. 7-Dombrowski, C. (2019). Accessibility and the ethics of design in technical communication. <i>Technical Communication</i>, 66(2), 148-162. 8-Salvo, M. J., & Rosinski, P. (2019). Critical technical communication pedagogy and the ethics of designing for accessibility. <i>Technical Communication Quarterly</i>, 28(4), 453-470. 9-Spinuzzi, C. (2021). Making information accessible and usable for everyone: The ethics of user-centered design. <i>Technical Communication</i>, 68(1), 41-55. 10-Gurak, L. J., & Lannon, J. M. (2019). <i>Technical communication and the human condition</i>. Routledge. <p>These articles and authors can serve as a starting point for further research and writing on the topic of ethical implications of non-human-centered designs in academic paper design.</p>	<p>Certainly! Conducting a comprehensive literature review on the ethical implications of using non-human-centered designs in academic paper design and addressing these implications can provide a solid foundation for your paper. Here is a selection of articles and authors that are relevant to this topic:</p> <ol style="list-style-type: none"> 1-Amodei, D., Olah, C., Steinhardt, J., Christiano, P., Schulman, J., & Mané, D. (2016). Concrete problems in AI safety. <i>arXiv preprint arXiv:1606.06565</i>. 2-Bender, E. M., Geburu, T., McMillan-Major, A., & Shmitchell, S. (2021). On the dangers of stochastic parrots: Can language models be too big? <i>arXiv preprint arXiv:2010.02573</i>. 3-Bostrom, N. (2014). <i>Superintelligence: Paths, dangers, strategies</i>. Oxford University Press. 4-Floridi, L., & Cows, J. (2019). A unified framework of five principles for AI in society. <i>Harvard Data Science Review</i>, 1(1). 5-Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. <i>Nature Machine Intelligence</i>, 1(9), 389-399. 6-Mittelstadt, B. D., Allo, P., Taddeo, M., Wachter, S., & Floridi, L. (2016). The ethics of algorithms: Mapping the debate. <i>Big Data & Society</i>, 3(2), 2053951716679679. 7-Price, W. N., & Cohen, I. G. (2019). Privacy in the age of medical big data. <i>Nature Medicine</i>, 25(1), 37-43. 8-Russell, S., & Norvig, P. (2016). <i>Artificial intelligence: A modern approach</i>. Pearson. 9-Taddeo, M., & Floridi, L. (2018). Regulate artificial intelligence to avert cyber arms race. <i>Nature</i>, 556(7701), 296-298. 10-Zeng, S., & Besold, T. R. (2018). Ethics in machine learning and data science: What should we teach? <i>arXiv preprint arXiv:1811.11130</i>. <p>Remember, this is not an exhaustive list, and there may be other relevant articles and authors to explore. Conducting a thorough literature review will help you gather diverse perspectives and insights on the ethical implications of non-human-centered designs in academic paper design, as well as identify potential solutions to address these ethical challenges.</p>

Figure 5. Literature review text generated by *ChatGPT-3.5* and *ChatGPT-4*

ses. Furthermore, the lack of explicit citations in the text poses a risk of potential plagiarism, assuming that the content is based on external sources. The absence of proper citations and references makes it challenging to evaluate the accuracy and credibility of the information presented in the articles.

4.4. Identification of the literature review

In the fourth prompt, the author asks for a comprehensive literature review to design an article (questions 6 of *ChatGPT-3.5* under the heading “Presentation of the general purpose and approach of the article”). The purpose of this prompt is to test how to design a literature review for an article.

In this study design, *ChatGPT* conducted a literature review on the topic. Prior to conducting the literature review, *ChatGPT-3.5* formulated a search strategy and identified relevant keywords. Subsequently, the literature review was conducted, resulting in the inclusion of ten references. Regrettably, none of these sources could be located or verified. On the other hand, *ChatGPT-4* presented ten references, out of which nine were successfully verified, while one remained unverifiable. The findings of this investigation suggest that *ChatGPT-4* demonstrates greater reliability and validity in terms of its literature review compared to *ChatGPT-3.5*. However, concerns arise due to the limited availability of literature sources in *ChatGPT-4* and the inability to verify all the recommended references. Consequently, the evaluation of the accuracy and credibility of the information presented in the literature becomes a challenging task.

4.5. Creating writing assistance

In the fifth prompt, the author is asking for writing assistance from *ChatGPT* to design an article, stating his purpose and target audience (questions 7 of *ChatGPT-3.5* under the heading “Presentation of the general purpose and approach of

Question	ChatGPT-3.5	ChatGPT-4
<p>I want to write an academic article about “What does the future of academic article design look like with the integration of ChatGPT and other machine learning technologies?” My goal is to make various scenarios about the future of this topic. My target audience is academics interested in this topic. Can you provide writing assistance?</p>	<p>Sure, I can provide writing assistance for your academic article. Here are some steps you can follow to get started:</p> <p>1-Introduction: In the introduction, you can provide a brief overview of the topic and its significance. You can also introduce the main focus of your article, which is to explore the future of academic article design with the integration of ChatGPT and other machine learning technologies.</p> <p>2- Literature review: In the literature review section, you can discuss the existing research on the topic of academic article design and the integration of machine learning technologies. You can also highlight the limitations of the existing research and explain how your article can contribute to the field.</p> <p>3-Methodology: In the methodology section, you can explain the approach you used to analyze the data and make predictions about the future of academic article design with the integration of ChatGPT and other machine learning technologies. This could involve conducting surveys or interviews with experts in the field, analyzing trends and developments in academic publishing, and reviewing existing research on the topic.</p> <p>4-Results: In the results section, you can present the various scenarios you have developed about the future of academic article design with the integration of ChatGPT and other machine learning technologies. You can explain the implications of each scenario and how it could impact the academic publishing industry.</p> <p>5-Discussion: In the discussion section, you can interpret your results and provide insights into what they mean for the future of academic article design. You can also discuss the limitations of your study and suggest areas for future research.</p> <p>6-Conclusion: In the conclusion, you can summarize the main findings of your article and discuss their implications for the academic publishing industry. You can also highlight the significance of your research and suggest avenues for future research.</p> <p>As you write your article, be sure to keep your target audience in mind and use language and terminology that is appropriate for academics in the field. Also, make sure to properly cite your sources and adhere to any formatting guidelines provided by your target publication.</p>	<p>Certainly! I can provide writing assistance for your academic article on the future of academic article design with the integration of ChatGPT and other machine learning technologies. Here's an outline to help you structure your article and explore various scenarios:</p> <p>1-Introduction</p> <p>Introduce the topic of the future of academic article design in the context of the integration of ChatGPT and other machine learning technologies.</p> <p>Explain the significance of this topic and its relevance to academics.</p> <p>State the purpose of the article and provide an overview of the scenarios to be explored.</p> <p>2-Current Landscape of Academic Article Design</p> <p>Provide an overview of the current practices and challenges in academic article design.</p> <p>Discuss traditional approaches to article design and the limitations they may have.</p> <p>Highlight the emergence and integration of machine learning technologies, particularly ChatGPT, in academic writing processes.</p> <p>3-Scenario 1: Enhanced Efficiency and Productivity</p> <p>Describe a scenario where the integration of ChatGPT and other machine learning technologies streamlines the article design process.</p> <p>Discuss how AI assistance can automate time-consuming tasks, such as formatting, referencing, and proofreading, leading to increased efficiency and productivity for researchers.</p> <p>4-Scenario 2: Augmented Idea Generation and Creativity</p> <p>Present a scenario where ChatGPT and other machine learning technologies act as creative collaborators.</p> <p>Explore how AI models can generate novel ideas, suggest alternative research directions, and inspire researchers to think outside the box.</p> <p>Discuss the potential for AI to contribute to interdisciplinary research and foster innovative approaches.</p> <p>5-Scenario 3: Personalized Writing Assistance</p> <p>Envision a scenario where machine learning technologies provide personalized writing assistance tailored to individual researchers' needs.</p> <p>Discuss how AI models can offer real-time feedback, suggest improvements in writing style, enhance language usage, and adapt to researchers' preferences.</p> <p>Highlight the potential for AI to assist non-native English speakers and researchers in improving the clarity and impact of their writing.</p> <p>6-Scenario 4: Ethical Considerations and Responsible Integration</p> <p>Explore a scenario that addresses the ethical implications of integrating ChatGPT and machine learning technologies in academic article design.</p> <p>Discuss the importance of ensuring transparency, avoiding biases, maintaining authorship integrity, and addressing concerns related to intellectual property and plagiarism.</p> <p>Highlight the need for responsible integration, human oversight, and ethical guidelines in the use of AI assistance in academic writing.</p> <p>7-Conclusion</p> <p>Summarize the scenarios discussed and their implications for the future of academic article design.</p> <p>Reflect on the potential benefits and challenges associated with the integration of ChatGPT and machine learning technologies.</p> <p>Encourage further research, collaboration, and thoughtful exploration of the evolving role of AI in academic writing.</p> <p>Remember to support your scenarios with relevant examples, scholarly references, and empirical evidence. Additionally, maintain a balance between the potential positive outcomes and the challenges that need to be addressed to ensure the responsible integration of ChatGPT and other machine learning technologies in academic article design.</p>

Figure 6. Writing assistance text generated by *ChatGPT-3.5* and *ChatGPT-4*

the article”). The purpose of this prompt is to test whether *ChatGPT* can design the article in accordance with the purpose and audience of the topic.

In this design, *ChatGPT-3.5* and *ChatGPT-4* both commence the article with an introductory section, where they elucidate the role played by *ChatGPT* and other machine learning technologies in the realm of academic article design. The two versions propose distinct scenarios within the article. While *ChatGPT-3.5* does not designate these scenarios as a discrete section, *ChatGPT-4* presents them under separate headings. *ChatGPT-3.5* offers a simplified presentation of the article’s title, whereas *ChatGPT-4* puts forth a more precise formulation. *ChatGPT-4* incorporates a dedicated section titled “Current landscape of academic article design” which delves into the existing practices in this field. In contrast, *ChatGPT-3.5* does not propose such a section. The delineation of scenarios as a separate section is not explicitly specified in *ChatGPT-3.5*, whereas *ChatGPT-4* presents each scenario under distinct headings. *ChatGPT-3.5* provides a concise summary of the article, while *ChatGPT-4* furnishes a more detailed summary that encapsulates the overarching purpose and content of the article.

Both *ChatGPT-3.5* and *ChatGPT-4* explore the future of academic article design by integrating *ChatGPT* and other machine learning technologies. They exemplify the impact of these technologies on academic article design through the presentation of diverse scenarios. Furthermore, both versions emphasize the importance of ethical considerations and responsibilities within the realm of academic article design. *ChatGPT-4* introduces a more intricate structural framework for the article, incorporating a section titled “Current landscape of academic article design,” which provides a comprehensive analysis of the existing practices in this field. *ChatGPT-4* presents the scenarios in a more precise manner, offering detailed explanations of the potential implications of *ChatGPT* and other machine learning technologies on the design of academic articles. Conversely, *ChatGPT-3.5* adopts a more general perspective and accords less emphasis to the specifics of the scenarios. *ChatGPT-4* advocates for a section dedicated to evaluating the impact of the scenarios, wherein the potential

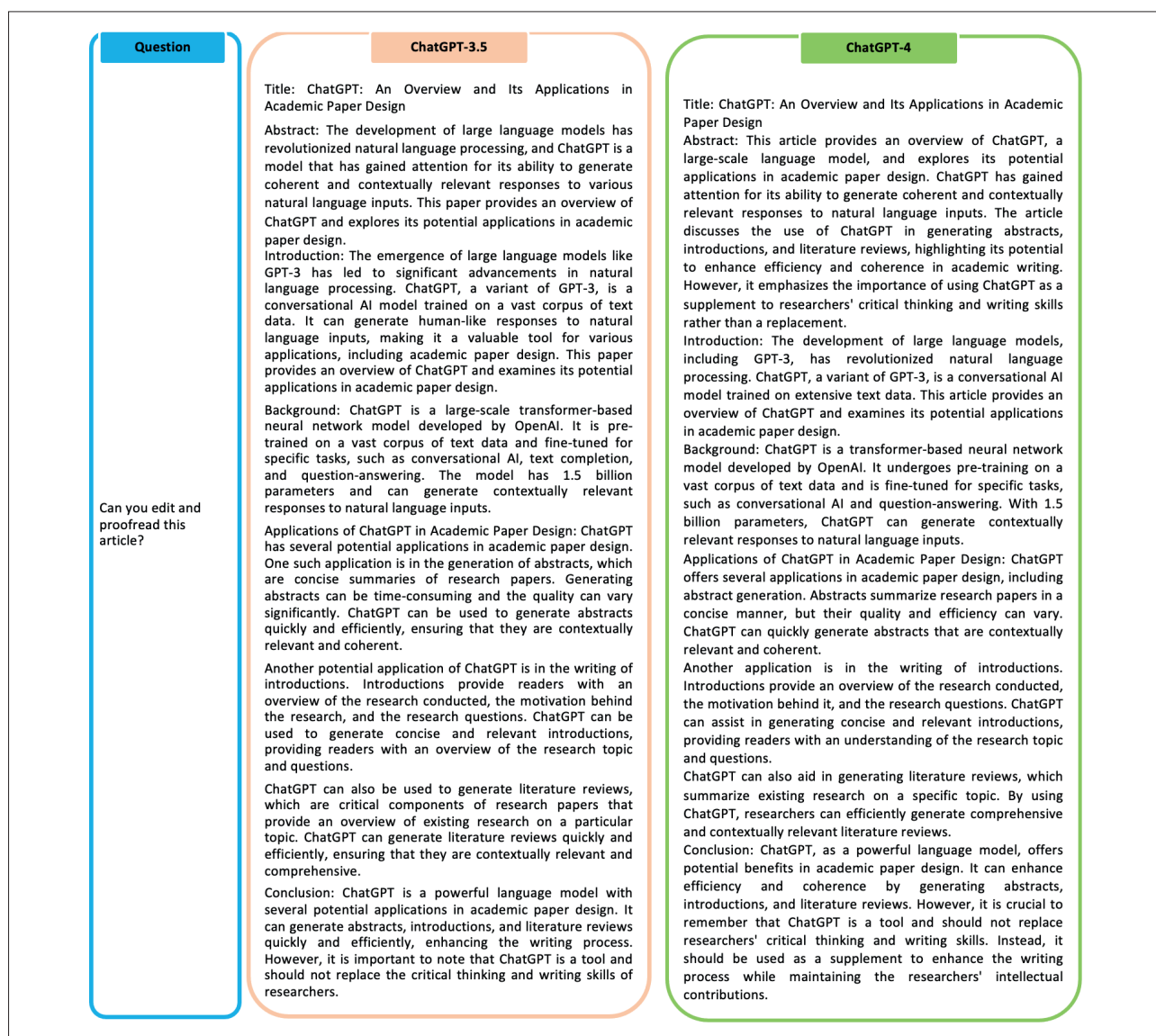


Figure 7. Editing and proofreading text generated by *ChatGPT-3.5* and *ChatGPT-4*

contributions, advantages, and disadvantages of each scenario on academic article design are discussed. *ChatGPT-3.5* does not include such a section. *ChatGPT-4* concludes the article with a summary of the scenarios, wherein the key points and general conclusions of each scenario are highlighted. *ChatGPT-3.5* does not incorporate such a summary section. In light of this comparison, it is evident that *ChatGPT-4* offers a more intricate structure and presents scenarios in a more specific manner. Conversely, *ChatGPT-3.5* adopts a broader perspective and allocates less focus to the details of the scenarios. Both versions explore the integration of *ChatGPT* and other machine learning technologies in the context of academic article design, although they differ in their treatment of specific subjects and the level of analysis they offer.

4.6. Editing and proofreading

In the sixth prompt, the author asks to edit and proofread an article (questions 1 of *ChatGPT-3.5* under the heading “Presentation of the general purpose and approach of the article”) created by *ChatGPT*. The purpose of this prompt is to test how *ChatGPT* will edit and proofread an article written by *ChatGPT* itself. The article has not been rewritten; you can find the article above.

ChatGPT-3.5 has made changes to the text to improve its comprehensibility. However, these changes primarily focus on basic corrections such as improving sentence structures and correcting grammatical errors. In *ChatGPT-4*, the text was meticulously revised and corrected. In this editing process, more attention was paid to sentence patterns, grammatical errors, and spelling. The text has been revised to ensure greater academic rigor and adherence to academic norms. This comparison reveals that the *ChatGPT-4* shows higher potential and achievement in proofreading. *ChatGPT-4* has further improved its adherence to academic norms and increased its comprehensibility by organizing the text more comprehensively. The use of language was made sharper and more effective, resulting in a text more suitable for an academic paper.

As a result of *ChatGPT-4*'s extensive revisions, which bring the text in line with academic norms and improve comprehensibility, the potential and success of editing becomes more evident. *ChatGPT-4* provides precise and concise changes that *ChatGPT-3.5* does not, while *ChatGPT-3.5* makes general revisions to improve comprehensibility.

5. Discussion

In this article, the potential of *ChatGPT* in academic article design has been explored. The study aims to investigate the capabilities, limitations, and overall suitability of both *ChatGPT-3.5* and *ChatGPT-4* in the context of academic article design. The overall aim of the paper is to provide suggestions for the use of language models such as *ChatGPT* in academic paper design and to discuss the effects of non-human-centered design approaches on academic writing processes. The results of this study will provide a basis for future research by discussing the potential benefits and limitations of using AI technologies and non-human-centered design approaches.

The article design process involves conversations between *ChatGPT-3.5* and *ChatGPT-4* and the author through a series of chat interfaces. The author asks questions and proposes ideas, while *ChatGPT-3.5* and *ChatGPT-4* provide feedback and suggestions and generate text based on the input. The methods of the study involve providing guiding questions to *ChatGPT* for writing articles and analyzing *ChatGPT*'s responses. The responses produced by *ChatGPT* during the research process were evaluated in detail by another expert academic. This expert has assessed the text generated by *ChatGPT* in terms of accuracy, consistency, and adherence to academic standards. At the end of the evaluation process, an agreement was reached with the author, thus eliminating the need for any revisions or final approval.

ChatGPT has demonstrated itself to be a reasonably competent conversational AI that can support the design process of academic papers in various ways. *ChatGPT-3.5* and *ChatGPT-4* exhibits the following capabilities in assisting with academic article design: 1) aiding in the design process, 2) generating ideas aligned with the overall purpose and focus of the paper, 3) producing consistent and contextually relevant responses to various natural language inputs, 4) partially assisting in literature reviews, 5) supporting paper design in terms of both content and format, and 6) providing reasonable editing and proofreading for articles. On the other hand, *ChatGPT-4*, in addition to the capabilities of *ChatGPT-3.5*, has shown potential as a valuable tool in the areas of critical evaluation and drafting and refining.

When evaluating the article design capabilities of *ChatGPT*, it was observed that both *ChatGPT-3.5* and *ChatGPT-4* demonstrated the ability to produce scholarly articles using a common format. The article design approach employed by *ChatGPT-3.5* exhibited a more generalized nature, while *ChatGPT-4* demonstrated a more focused approach. By offering the article writer guiding questions and advice on which ones to choose that are the most pertinent and interesting, the answer of *ChatGPT-3.5* uses an inquiry-based approach. The response from *ChatGPT-4*, on the other hand, provides a more detailed outline by suggesting a structure and heading for the piece. *ChatGPT-4* highlights specific subjects and offers recommendations. It also contains a distinct part on critical evaluation, which is absent from *ChatGPT-3.5*. Although the responses for the *ChatGPT-3.5* and *ChatGPT-4* cover the same ground, there are differences in their structure and concentration. While evaluating *ChatGPT*'s writing assistance capability to design the article in accordance with the purpose and target audience of the topic, it was observed that both versions suggested different scenarios within the article. While *ChatGPT-3.5* does not designate these scenarios as separate sections, *ChatGPT-4* presents them under distinct headings. *ChatGPT-3.5*, while providing writing assistance, possesses a broader perspective and focuses less on the details of the scenarios. In contrast, *ChatGPT-4* presents a more detailed structure and addresses the scenarios in a more specific manner. They exhibit differences in their approach to specific topics and the level of analysis they provide. When *ChatGPT*'s ability

to edit and proofread an article was evaluated, it was observed that *ChatGPT-3.5* made general revisions to improve comprehensibility, while *ChatGPT-4* provided precise and concise changes that *ChatGPT-3.5* did not. *ChatGPT-4* made the text more in line with academic norms and increased comprehensibility. During editing and proofreading, *ChatGPT-4* corrected spelling and punctuation errors, chose more appropriate verbs, provided clarity and context to statements, highlighted important points, gave details, and even added sentences to emphasize the importance of the topic.

The traditional structure of an academic article typically includes sections such as abstract, introduction, literature review, methods, findings, discussion, and conclusion. *ChatGPT* places emphasis on the creation of abstracts, introductions, and literature reviews, effectively guiding the article design process. By providing headings that can be utilized in an article and offering guidance on the content to be included under each heading, *ChatGPT* successfully facilitates the design of academic articles. Furthermore, in the methodology section, *ChatGPT* suggests relevant methods that are applicable to the given topic.

ChatGPT is deeply changing the design practice. The advantages of using *ChatGPT* in the academic article design process include increased efficiency, improved organization, and the ability to produce content quickly. With the use of *ChatGPT*, a consistent draft for the article was created quickly, the language and structure of each section were improved, and even some of the content was generated by *ChatGPT* itself. As many authors have claimed, *ChatGPT* has demonstrated potential to provide new discoveries and insights for academic article design. It has significantly reduced energy and time waste by creating article designs similar to those produced by humans (Aljanabi *et al.*, 2023; Alshater, 2022; Aydin; Karaarslan, 2022; Castillo-Gonzalez, 2022; Curtis, *ChatGPT*, 2023; Gilat; Cole, 2023; Golan *et al.*, 2023; Huang; Tan, 2023; Hutson, 2022; Lin, 2023; Nguyen, 2023; O'Connor; *ChatGPT*, 2022; Rudolph; Tan; Tan, 2023; Túnéz-López; Fieiras-Ceide; Vaz-Álvarez, 2021). Studies conducted by Aljanabi *et al.* (2023), Hammad (2023), and O'Connor and *ChatGPT* (2022) have shown that *ChatGPT* can understand the objectives behind a problem and provide users with the information they need more quickly and effectively. However, technology limitations were also evident, especially in maintaining consistency and ensuring the accuracy of the generated text.

ChatGPT is capable of quickly and efficiently generating articles, but it lacks the ability to create accurate and complete citations and references. In this study, the inclusion of proper in-text citations and references was explicitly requested; however, neither response successfully met this requirement. For the in-text citations, no sources were provided in either response. Moreover, *ChatGPT-3.5* referenced three sources in the paper, but upon further investigation, it was discovered that none of these sources could be located or verified. As for *ChatGPT-4*, although it included a total of 10 references, only two of them were identifiable and accessible. Consequently, the credibility and reliability of the sources mentioned in both responses are questionable. Furthermore, since the citations and sources are not clearly indicated, there is a risk of plagiarism and academic misconduct, as expressed by some authors (Alkaissi; Mcfarlane, 2023; Alshater, 2022; Bang *et al.*, 2023; Caira; Russo; Aranda, 2023; Cotton; Cotton; Shipway, 2023; Gao *et al.*, 2022; Ma *et al.*, 2023; Williamson; Macgilchrist; Potter, 2023; Perkins, 2023; Sabzalieva; Valentini, 2023; Srivastava, 2023; Stokel-Walker, 2023; Sullivan; Kelly; McLaughlan, 2023; Thorp, 2023). Considering these reasons, and especially *ChatGPT's* inability to access literature beyond 2021, its use as a reliable information source is limited. Even if *ChatGPT-4* tries to overcome this limitation using web browser plugins, it is important to note that the model is trained on internet data until 2021.

On the other hand, *ChatGPT* has shown various limitations in understanding some issues and requests, as well as in creating or completing citations and literature reviews. Although *ChatGPT* can create designs and texts suitable for an academic article, it has many shortcomings when looking at the article examples it has written. At this point, there is also a concern that it may lead to a lack of critical thinking, originality and analysis and provide biased information (Bishop, 2023; Dutton, 2023; Huang; Tan, 2023; İskender, 2023; Nguyen, 2023). In addition, there are concerns that *ChatGPT* may not represent the moral, social and cultural ideals that academics value (OpenAI, 2022). When considered in the context of commercialization purpose (Huang; Tan, 2023), it should not be overlooked that *ChatGPT* is not conscious and lacks self-awareness (Pavlik, 2023).

Nori *et al.* (2023) have previously emphasized the importance of studying the progress and capabilities of these two *ChatGPT* models when the expected launch of *GPT-4* takes place. The main difference between *ChatGPT-3.5* and *ChatGPT-4* is that *ChatGPT-4* allows users to send up to 25,000 words, an eightfold increase from the number allowed by *ChatGPT*. In addition, OpenAI claims that their latest technology produces fewer errors, so-called "hallucinations". In the past, *ChatGPT* could disappear, give nonsensical answers to your query, or even send stereotypical or incorrect information. In addition, *ChatGPT-4* is more capable of expressing creativity and manipulating language (Hughes, 2023; OpenAI, 2023). A study conducted by Rahaman *et al.* (2023) shows that *ChatGPT-4* is significantly more successful than *ChatGPT-3.5* at translating languages, answering questions, and understanding human emotions. The study emphasizes that *ChatGPT-4* outperforms its previous version in every respect. Another study by Metz and Collins (2023) shows that *ChatGPT-4* successfully passed the bar exam and various standardized tests by summarizing and interpreting both visuals and texts. They also observed a significant increase in accuracy compared to *ChatGPT-3.5*. *ChatGPT-4* is 40% more likely to produce real answers than *ChatGPT-3.5* (OpenAI, 2023). On the other hand, Chen, Zaharia and Zou (2023) evaluated the March 2023 and June 2023 versions of *GPT-3.5* and *GPT-4* on four different tasks: solving math problems, answering sensitive/dangerous questions, generating code, and visual reasoning. They found that the performance and behavior of both models could change significantly over time. For example, *GPT-4* was excellent at identifying prime numbers in

March 2023 (accuracy 97.6%) but performed poorly on the same questions in June 2023 (accuracy 2.4%). Interestingly, *GPT-3.5* performed much better on this task in June 2023 compared to March 2023.

A study conducted by **Cao** (2023) focused on the ability of *ChatGPT-4* to cite scientific articles. This study found a significant inconsistency in the performance of *ChatGPT-4* across different fields. This trend highlights a significant limitation in the functionality of *ChatGPT-4*'s scientific reference citation and indicates a need for improvements in specificity and validity. The same research found that when queried about topics requiring expertise, *ChatGPT-4* tends to prioritize more general topics. This situation, especially when it comes to academic research requiring expertise, necessitates continuous human intervention and verification process to ensure the applicability of the model's outputs (**Huang; Tan, 2023; Zhang; Gosline, 2022**). Another study by **AlAfnan and Mohdzuki** (2023) indicates that *ChatGPT-4* uses declarative, imperative, and interrogative moods. The declarative mood is typical in academic writing responses, while the imperative mood is typical in responses related to case studies.

6. Conclusion

In this study, it is possible to observe how much and how *ChatGPT-3.5* and *ChatGPT-4* intervened in the design of an academic article based on their suggestions. This research is in line with the goal of exploring the role of *ChatGPT* in academic article design in terms of human-machine collaboration.

The use of *ChatGPT* in academic article design represents a step towards non-human-centered design in the academic world. Although there are limitations to the technology, it also offers many opportunities to increase efficiency and creativity in the research process. As artificial intelligence technology continues to develop, it is important to carefully evaluate the potential benefits and drawbacks of using non-human-centered design methods in academic research. Despite the shortcomings of both, *ChatGPT-3.5* to some extent, and *ChatGPT-4* more broadly, have the potential to logically and appropriately specify the steps to follow in the design of an academic article. In the study, it was determined that both *ChatGPT-3.5* and *ChatGPT-4* can serve as a valuable tool in academic article design. Therefore, as noted by **Farias** (2023), *ChatGPT* has demonstrated considerable functionality as a tool that can be used in the preparation of academic/scientific texts. However, while *ChatGPT* offers advantages such as accelerated writing, enhanced productivity, and comprehensive responses, it also brings potential disadvantages including a decrease in critical thinking, concerns about plagiarism, misinformation, and a lack of originality and innovation. In order to mitigate such disadvantages, it is indispensable to establish precise guidelines for the ethically compliant use of *ChatGPT*.

Future research should continue to explore the impact of *ChatGPT* and similar designs on research quality and validity. This way, the role of artificial intelligence technology in academic research can be further explored. Furthermore, future studies could be initiated to compare the results obtained with *ChatGPT* against other systems, such as Google's *Bard* or Microsoft's *Chat Bing*. In addition, it may be illuminating to compare the results obtained with *ChatGPT* with the results obtained with AI research assistants capable of finding sources, citing references, summarizing results, or producing relevant text, such as *Elicit*, *Scite*, *SciSpace*, *Research Rabbit*, *Connected Papers*, *Perplexity*, *Paperpal*, and *Litmaps*.

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